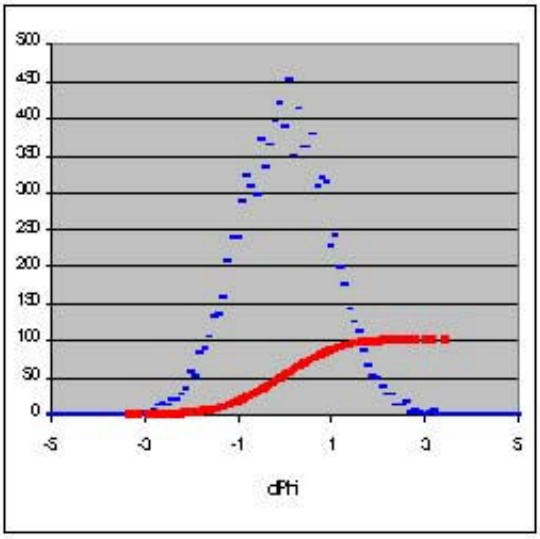
The following plots summarize the final phase and energy of the exit beam from 10k linac designs in which all linac cavities (6 DTL, 4 CCL & 81 SRF) have dynamic error tolerances imposed on them. We assume a uniform distribution of control errors within the tolerance bands. The rf errors are uncorrelated as are the final beam values.



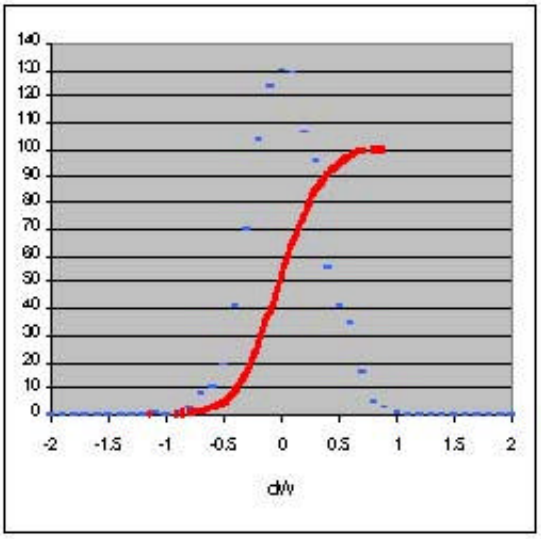
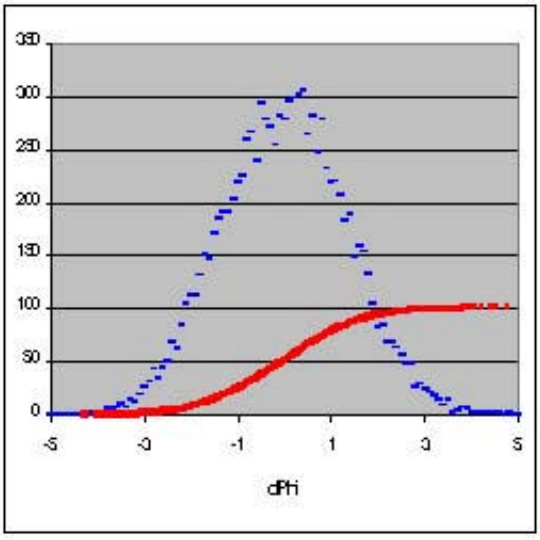


Figure 1 Expected final beam phase & energy, RF control tolerance =±0.5% & ±0.5°, 10k samples



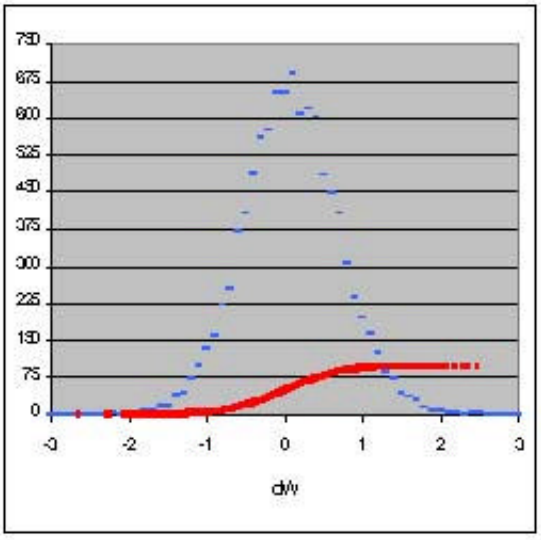


Figure 2 Expected final beam phase & energy, RF control tolerance =±0.5% & ±1.0°, 10k samples

Per Deepak: at the level of one part in 10k, the allowable phase and energy jitter is ±2.7° & 1.5 MeV.

Reference tolerance (figure 1) exit beam phase & energy jitter are ±3.3 & ±1.6 MeV. This just misses the requirements and probably has something to do with how the rf control tolerances were originally set. Now with the higher cavity fields, these tolerances are probably more sensitive.

Proposed tolerance (figure 2) exit beam phase and energy jitter are –4.3/+4.8 & ±2.5 MeV.

The real rf dynamic field tolerance calculated by Amy, due to a looser tolerance on building temperature, is ±0.8° & ±0.5%. I just asked Ken to run round numbers to bracket the problem because I didn't expect a problem. For the accuracy of this calculation we can probably scale to 0.8°. So I think for the real proposed tolerance the exit beam phase and energy jitter will be ±4.0° & ±2.15 MeV. This misses the requirement by a considerable amount. Who is going to tell Norbert?

We can make similar runs through the energy corrector. In this case Deepak, what energy jitter could we tolerate at the achromat?

Jim